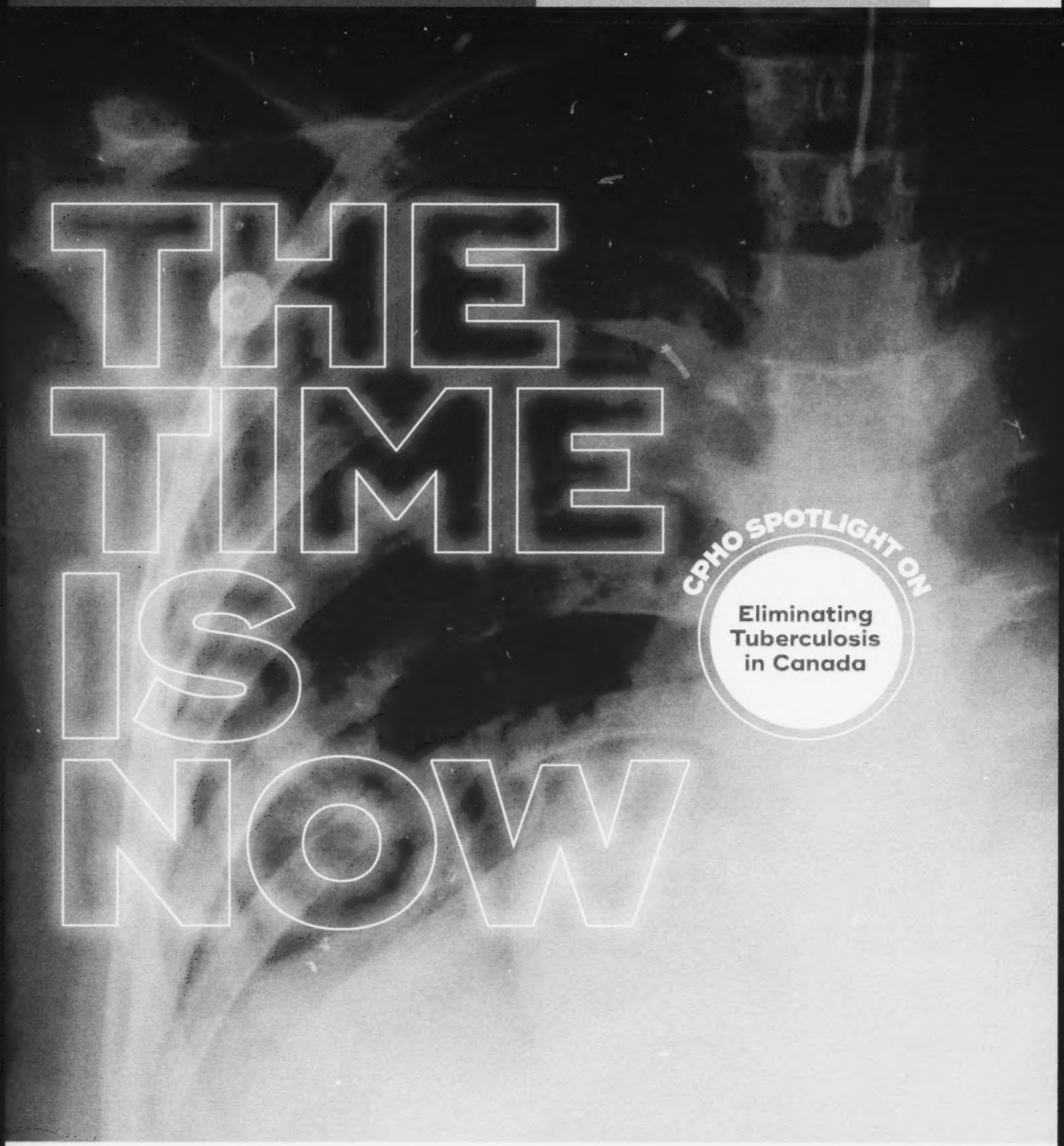

THE TIME IS NOW
CPHO SPOTLIGHT ON
Eliminating Tuberculosis in Canada

Canada

A MESSAGE
FROM CANADA'S CHIEF PUBLIC HEALTH OFFICER

Tuberculosis (TB) is the epitome of inequity in public health; it is a social disease with a medical aspect.

As this report makes clear, social determinants of health such as **poverty**, **food insecurity**, **inadequate housing** and **overcrowding** contribute to health inequity and are significant underlying risk factors for TB.

While Canada has come a long way toward reaching TB elimination with the advent of antibiotics and overall improvement in socio-economic conditions, progress has plateaued since the 1980s.

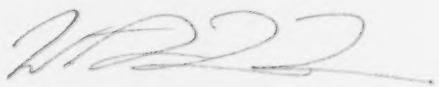
My decision to shine a spotlight on TB with this report is largely inspired by the **current momentum to eliminate TB coming from the force of leadership within Inuit communities**. **TB rates are almost 300 times higher among Inuit** than for the non-Indigenous Canadian born population. These unacceptably high rates reflect the Inuit's unique experience with TB, a long history of social inequities, and the ongoing impacts of colonization.

In addition, about 70 percent of cases of active TB disease in Canada are diagnosed in people who were born outside the country. Adult refugees from locations with a high incidence of the disease who have latent TB infection (LTBI) are at the highest risk of developing active TB disease. With enhanced knowledge of the predictors of active TB disease in people migrating to Canada, we will be able to understand their unique experiences with TB and better tailor interventions and supports.

There is no better time than now to accelerate our efforts to eliminate this **treatable and curable disease**. Improved rapid diagnostics for active TB disease are now available, allowing for timely treatment and reducing transmission. Reactivation of the disease from untreated LTBI remains a major source of new active TB disease and transmission. Better tests and approaches to identify those individuals at the highest risk for disease reactivation, combined with more timely and effective LTBI treatment plans, all offer great promise.

The key to achieving TB elimination in Canada lies in reducing the disproportionate impact of the disease on Indigenous peoples, in particular Inuit, and foreign-born individuals. This can only be achieved through **collaborative action**.

Ultimately, the solutions to this complex social disease will be driven by the communities themselves, with **sustained support** from many players, including governments, academics, experts and other stakeholders. Efforts that address **social inequities** coupled with **improved diagnosis and treatment** of active TB disease and LTBI will level the playing field and help **eliminate TB in all of Canada.**



Dr. Theresa Tam
Chief Public Health Officer of Canada

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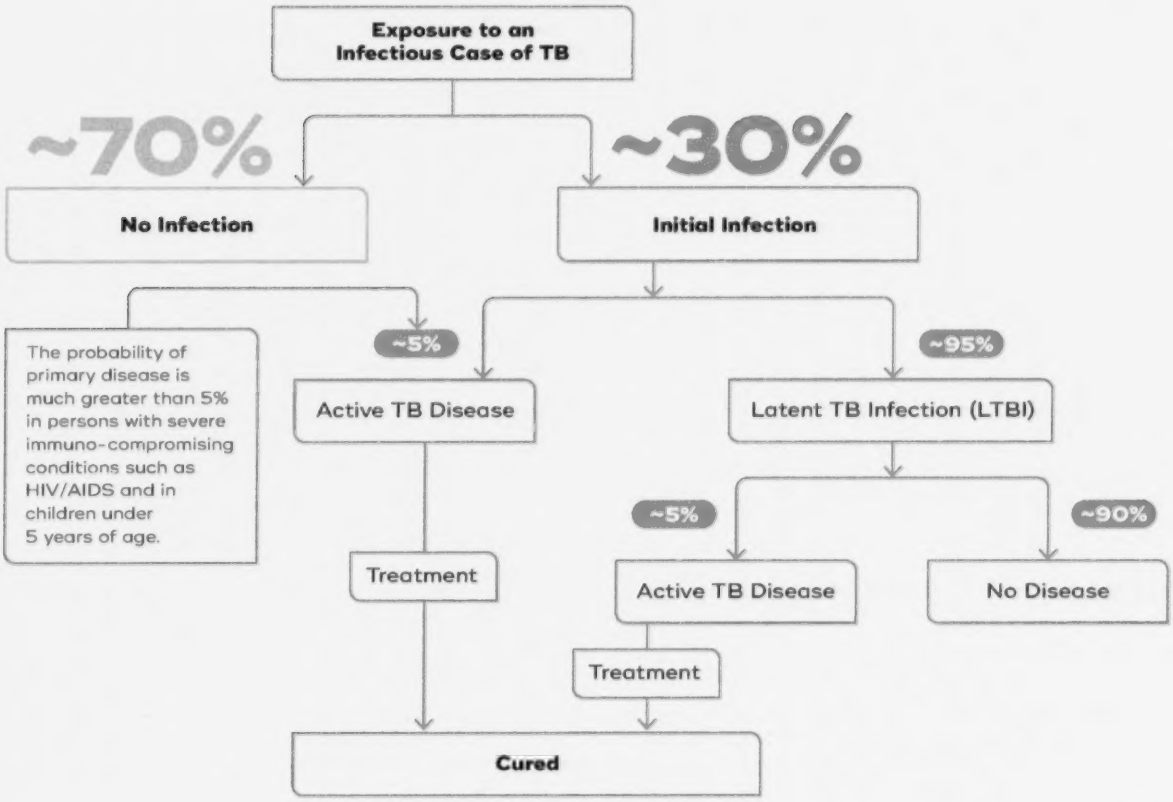
TB IN CANADA TODAY

What is tuberculosis (TB)? TB is a serious but **treatable and curable** infectious disease. It is caused by the bacterium *Mycobacterium tuberculosis* and is spread through the air after prolonged contact with an infectious person through coughing, sneezing and talking.[1] After breathing in the TB bacteria, most people's immune systems are able to fight off an infection or "contain" the bacteria, which prevents or delays the onset of the illness (see Figure 1). This is called **latent TB infection (LTBI)** (see Image 1). A person with LTBI is not sick and is not contagious.[1] However, after initial infection, about one in ten people in Canada will develop **active TB disease** over time, often within the first two years of becoming infected.[2]

TB primarily infects the lungs but can also affect other parts of the body, including the kidneys, spine and brain.[1] Symptoms of active TB disease can vary but typically include a cough that lasts two weeks or longer, coughing up blood, chest pain, weakness or tiredness, weight loss, and chills and fever, among other signs.

While overall rates of TB are currently low in Canada, the global burden of the disease remains high. TB is the leading cause of death worldwide from an infectious disease with just over 10 million people diagnosed with the active form of the disease, causing close to 1.7 million deaths in 2016.[3] Canada has the second lowest incidence of all G7 countries after the United States.[4] The latest data show that there were over 1,700 people diagnosed with active TB disease in Canada in 2016, resulting in a rate of just under 5 cases per 100,000 (see Figure 2).[4]

FIGURE 1:
THE PATHOGENESIS OF TB IN AN INFECTED HOST

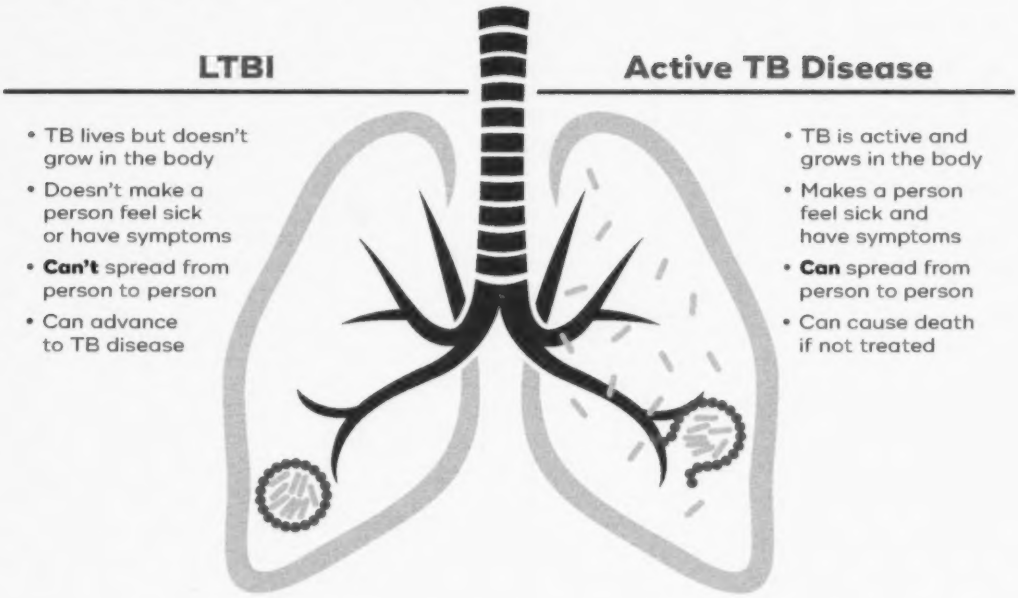


Sources: adapted from the Public Health Agency of Canada (2014). Canadian Tuberculosis Standards, 7th Edition; and Shaler, C. R., Horvath, C., Lai, R., & Xing, Z. (2012). Understanding delayed T-cell priming, lung recruitment, and airway luminal T-cell responses in host defense against pulmonary tuberculosis. Clinical and Developmental Immunology, 2012.

Tremendous gains have been made in the prevention and control of TB in Canada since the 1940s and 1950s when the country's overall rates were high and many people died of the disease.[5] The development of antibiotics, notably streptomycin, in the 1940s along with social and infrastructure improvements that reduced the likelihood of person to person transmission of TB radically reduced the impact of this infection on the health of many Canadians.[5]

Despite these important gains, those that remain disproportionately affected by active TB disease in Canada are **First Nations on-reserve, Inuit and foreign-born individuals in Canada,[4,6] particularly refugees, from countries with a high incidence of TB.**[2,4,7] These populations are the focus of this report. Canadian-born, non-Indigenous people make up a small proportion of active TB cases (see Figure 3).[4]

IMAGE 1:
LTBI VS. ACTIVE TB DISEASE LUNG DIAGRAM


LTBI
• TB lives but doesn't grow in the body
• Doesn't make a person feel sick or have symptoms
• **Can't** spread from person to person
• Can advance to TB disease
Active TB Disease
• TB is active and grows in the body
• Makes a person feel sick and have symptoms
• **Can** spread from person to person
• Can cause death if not treated

Source: adapted from Kanabus, A. (2017). Information about Tuberculosis. Global Health Education.

Others also at risk of becoming infected with TB bacteria and developing active TB disease include **the homeless, injection drug users, residents of correctional facilities or long-term care facilities, health care workers and those with an impaired immune system**.[2]

First Nations, Inuit and Métis

The TB epidemic was brought to Canada by Europeans in the 18th century and then dispersed among the population.[8] The sustained impact of colonialism still contributes to the high rates of TB we see today in the Northern First Nations and Inuit communities.[9] With colonization came the removal of First Nations from their lands and territories and the forced relocation of Inuit to government-determined settlement areas across Inuit Nunangat. The establishment of the reserve system, followed by the residential schools era, aggravated the impact of TB through over-crowding, poor nutrition, and inadequate sanitation.

Many First Nations, Inuit and Métis children died from TB while attending residential schools.[10] In the 1930s and 1940s TB mortality rates exceeded 8,000 per 100,000 among children confined to residential schools and 700 deaths

The CD Howe: In the 1940s ships such as the CD Howe or "hospital boats" were used in the Eastern Arctic Patrol to test and evacuate Inuit with TB.[13] If found ill, the letters "TB" were printed on the patient's hand and they were transported to provincial hospitals in the South and sanatoria for treatment sometimes only hours after diagnosis .[13] The forcible removal of people (even children and infants) from their families and loved ones resulted in great emotional distress and, in some cases, hindered the survival of those at home.[13]

per 100,000 among adult First Nations people living on reserve.[9] These mortality rates from TB are among the highest ever recorded in the world.[9]

In 2016, First Nations, Inuit and Métis made up just under 5% of the total Canadian population, but accounted for almost 20% of reported cases of active TB disease.[4] Rates vary across Indigenous populations, for instance, the rate of TB among Inuit was almost **300 times higher** than the rate in the Canadian-born, non-Indigenous population in 2016 (see Figure 4).[4] However, while little progress has been made since the 1980s, the incidence rate among First Nations living off-reserve, as well as among the Métis, has started to decrease over the past decade (see Figure 5).[4]

It is clear that more needs to be done to reduce the serious impact TB is having on First Nations living on-reserve and Inuit.

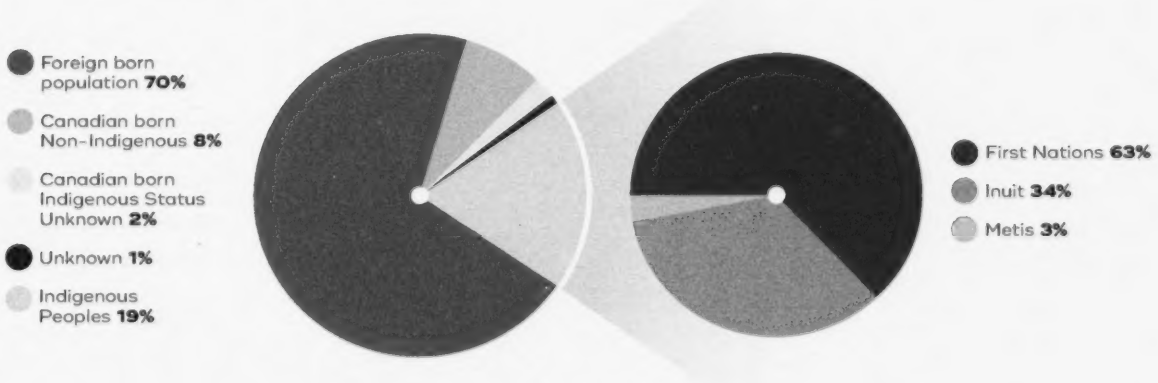
Foreign-born populations

Canada has rigorous medical requirements for immigration prior to entry. Before entering Canada, all individuals applying for permanent residency, and certain individuals applying for temporary residency, undergo an immigration medical examination which includes a chest x-ray for applicants 11 years of age and older to detect active TB disease.[2] This process is in place to ensure that those with active TB disease, which is contagious, are treated prior to their arrival in order to minimise the risk of passing it on to someone else.[2]

Yet, due to the nature of the disease, foreign-born populations with LTBI can become ill with active TB disease, months or years after the migration process. Because of this risk, individuals arriving in Canada report to local public health authorities for further follow-up if there was evidence of previous active TB disease. As previously noted, LTBI is not contagious and most people with LTBI do not become sick with active TB disease. Additionally, migrants to Canada can become infected with TB bacteria during return travel to their country of origin.[2] It is important to note that anyone, born in Canada or elsewhere, who spends enough time in a country with high TB incidence can also become infected with TB.[11]

In 2016, the foreign-born population, representing approximately 22% of the total Canadian population[12], accounted for 70% of reported new or re-treatment cases of active TB disease for a rate of 15 cases per 100,000.[4]

FIGURE 3:
DISTRIBUTION OF ACTIVE TUBERCULOSIS CASES (NEW AND RE-TREATMENT) BY POPULATION GROUP, CANADA, 2016



Source: Vachon, J., Gallant, V., Siu, W. (2018). Tuberculosis in Canada, 2016. Canada Communicable Disease Report, 44(3/4), 75-81.

FACTORS THAT INFLUENCE DISEASE

A variety of **personal risk factors** and **the social determinants of health** come into play for TB infection and disease development. Because it attacks the immune system, the most important risk factor for the development of active TB disease for a person with LTBI is HIV infection.[14] Other personal risk factors that reduce the ability of the body's immune system to fight off a TB infection include: smoking tobacco, alcohol and substance use, as well as diabetes and medications that impair the immune system.[14,15] Public health messages such as "if you puff, don't pass" are used to educate about the risks of becoming infected with TB during shared use of tobacco and cannabis smoking devices.[16]

Poverty is a recognized social determinant of health. It enables vulnerabilities that expose people to simultaneous risk factors for TB, including crowded housing and malnutrition.[14]

In addition, barriers to timely health care, including delays from diagnosis to treatment[14] and a lack of culturally competent health care can negatively impact TB outcomes.[17] Delays in diagnosis and treatment increase the risk of consequences to the person, including death, and increase likelihood that the TB bacteria will be transmitted to others. Fear of being discriminated against due to having an infectious disease, or stigma, can be a significant contributing factor to delays in diagnosing TB.[18] Some people with TB are subject to multiple types of stigma and discrimination at the same time, such as based on ethnicity, or living in poverty, or with a mental illness.

The World Health Organization (WHO) defines social determinants of health as the conditions in which people are born, grow, live, work and age.[30]

Health equity means that all people can reach their full health potential and should not be disadvantaged from attaining it because of their race, ethnicity, religion, gender, age, social class, socioeconomic status, geography or other socially determined circumstance.[31]

First Nations, Inuit and Métis

Due to the ongoing effects of colonization, First Nations, Inuit and Métis experience distinct determinants of health which affect susceptibility to TB including inadequate housing and community isolation.[19,20] Some factors that contribute to high rates of active TB disease among these groups include:

Inadequate housing conditions can affect risk for TB infection and outcomes as a result of poor ventilation and air quality in the home.[15,21] For instance, almost half of Inuit live in houses they cannot afford, require major repair, or which are not sufficiently large.[22]

Related to the above, **overcrowding** can also increase the risk of TB transmission. Approximately one-quarter of First Nations adults live in over-crowded housing[23] that lack basic amenities.[19]

Food insecurity – the state of being without reliable access to a sufficient quantity of affordable, nutritious food – can lead to **hunger and malnutrition**. A study in Nunavik has shown that inadequate nutrition is associated with increased susceptibility to LTBI.[24] Nearly one quarter of Inuit have reported experiencing food insecurity.[22] This is largely linked to food shortages due to harsh climate, as well as not having enough money given the expensive retail food options.[25]

"If we start with this idea that we can eliminate TB in Inuit Nunangat, then I hope that other things will follow because you can't look at this issue... without thinking that we need to do something about overcrowding or social conditions." [32]

NATAN OBED
President of Inuit Tapiriit Kanatami

Access to health care can be a barrier to treatment. First Nations patients can experience delays in the diagnosis and treatment of active TB disease when they are great distances from medical facilities.[15] In addition, Inuit who live in remote and isolated communities face unique challenges to accessing appropriate health care services. For example, they are often treated by health care workers from the South who may never have seen a case of TB.[26] In addition, health care workers are often unfamiliar with the language and culture, which makes providing care more challenging.[26]

"...there is a TB crisis in Nunavut at this very moment. There are fourteen out of the twenty-five disparate communities wrestling with active and latent cases, many of them children. The numbers are small (compared to a place like India, they're infinitesimal), but they loom very large in a population of roughly thirty-five thousand...The active cases are in treatment. It's prodigiously difficult to maintain and oversee the regimen. But treatment works. As you know, TB is a hundred per cent curable."[60]

STEPHEN LEWIS
Philanthropist

Foreign-born populations

The conditions before and after immigrating to Canada can pose physical, mental and social challenges. Moving to a new country demands a lot of change in a short time period including leaving friends and family behind, learning a new language, and the stresses of integrating into a new society. Although observations show that many migrants benefit from what is called the "healthy immigrant effect" and can have better overall health than the Canadian born, these risk factors can have a significant impact on the likelihood of foreign-born individuals developing active TB.

A recent Canadian study following over a million people who became permanent residents of British Columbia between 1985 and 2012 found that active TB was diagnosed at a rate of about 24 per 100,000 people. Refugee immigration class and higher TB incidence in the country of birth were among factors that were strong predictors of TB incidence.[7]

Availability of health care services before migration, which can be impacted due to experiences with disasters or conflicts, can contribute to the overall health of migrants prior to their arrival in Canada.[17] When immigrating to Canada, foreign-born persons such as refugees can sometimes experience **travelling for prolonged periods**, and/or under unsafe conditions, which can contribute to overall poor health and susceptibility to TB.[17,27]

Once in Canada, stressful living conditions in the years following immigration can contribute to the reactivation to active TB disease.[27] Further, **language and cultural barriers** can become reasons for delaying diagnosis and completing treatment.[17,18,29] Limited knowledge of the availability of services, what causes TB, and its symptoms as well as **misconceptions** of TB can lead to a delay in seeking health-care.[17,29]

Specific migrant communities may distrust public services which may delay health care seeking. For instance, undocumented migrants may fear encounters with police, or legal authorities, which can be a major deterrent to seeking health care.[17]

A higher proportion of recent immigrants face **food insecurity** and **housing** issues when compared with the general Canadian population,[22] and this can impact their health. For many migrants, their food and housing situation improves after 10 years.[22]

"The cultural connotations of TB for immigrant populations, and for anyone, are important. Sometimes people may associate TB with death or the old sanatoria and may avoid diagnosis or treatment."[33]

ELIZABETH REA
Associate Medical Officer of Health, Tuberculosis Prevention and Control, Toronto Public Health

TB ELIMINATION

Globally, about two billion people out of the world's population of eight billion are estimated to be infected with LTBI.[34] The target of the World Health Organization's (WHO) "End TB Strategy" is to reduce the global incidence to ten cases per 100,000 or less by 2035.[3] Canada is committed to meeting the WHO goal of reaching less than one TB case per 100,000 by 2035.[35]

Relying on medical interventions alone will not be enough to eliminate TB. As Sir Michael Marmot notes, "why treat people and send them back to the conditions that made them sick?".[36] That cycle needs to be broken.

The low rate in the Canadian-born non-Indigenous population of 0.6 per 100,000 is proof of the concept that TB can be eliminated in all populations in Canada.[4] Achieving this will require coordinated action by many partners on several fronts, including:

- The social determinants of health and health inequities;
- Awareness and education;
- Medical advancements;
- Community-led TB initiatives;
- Global TB elimination efforts.

The social determinants of health and health inequities

Efforts that improve living conditions and address poverty will generate health benefits well beyond TB. To help address health inequity, investments are being made to improve the living conditions for Indigenous Canadians.[37]

For example, housing improvements are a priority. The Assembly of First Nations and the Chiefs Committee on Housing and Infrastructure are jointly driving development of a *First Nations National Housing and Infrastructure Strategy*, which will include housing both on- and off-reserve.[38] At the same time, all partners and stakeholders in First Nations health

The World Health Organization has classified tuberculosis as a disease of poverty.[61]

are collaborating towards development of a *10-year First Nations Housing Strategy* aimed at supporting housing on reserve.[37] In addition, resources have been committed for an Inuit-led housing plan in the Nunavik, Nunatsiavut, and Inuvialuit regions, which supplements funding provided for housing in Nunavut in 2017.[39] The Inuit Crown Partnership Committee (ICPC) was created as a joint effort between the Government of Canada and Inuit elected officials to advance shared priorities, such as an Inuit Housing Strategy that will better meet the housing needs of the population.[40]

The *Truth and Reconciliation Commission of Canada (2015)* report outlines the actions necessary to redress the legacy of residential schools and advance the process of reconciliation.[10] The underlying historical context of intergenerational trauma and cumulative disadvantage as experienced by Indigenous populations must be addressed by and for First Nations, Inuit, and Métis. The work outlined by the Nanilavut Initiative in the North is an example of an Inuit led solution.[10]

The key risk factor for TB in foreign-born populations is coming from a country with high rates of TB, which can be heightened for those coming from an impoverished country with inadequate health systems to diagnose and treat the disease. While most foreign-born Canadians are economic migrants who enjoy a high standard of life, a subset, including refugees, come from challenging living conditions and may also encounter relative poverty after they settle in Canada at least for a period of time.[22] More research can shed light on the socioeconomic status of the foreign-born populations who are most affected with TB to support more targeted programming.[27]

Awareness and education

Stigma, or being made to feel shame because of an illness, can be a barrier to screening and treatment as many people may fear that a diagnosis of TB could affect their relationships with friends, families, or communities. More research on stigma in low incidence countries could offer innovative opportunities to conduct TB elimination programs in a way that does not inadvertently reinforce stigmatization.[41]

Education and awareness for healthcare providers serving First Nations and Inuit communities is an essential component to eliminating TB. One example is a 2016 community mobilization project in Kangiqsualujjuaq, Nunavik, which aimed to increase TB awareness among Inuit.[10] Community involvement in prevention activities, and a high level of trust between health care providers and community members, was essential to the project's success.

"The great thing about TAIMA TB is it showed us a new way."

NATAN OBED
President of Inuit Tapiriit Kanatami [62]

Engagement and empowerment of Indigenous leaders, health professionals and community members is an equally important component (see Image 2). For example, **TAIMA TB** is a group of research projects supported by the Canadian Institutes of Health Research, the Government of Nunavut, the Public Health Agency of Canada, and the Nunavut Tunngavik Incorporated (NTI) in collaboration with the Ottawa Hospital Research Institute. Aimed at helping Inuit in Canada stop the transmission of TB in their communities, the partnership is based on principles of **collaboration**, **education**, **innovation**, and **evaluation**. One of the projects involves raising community awareness about

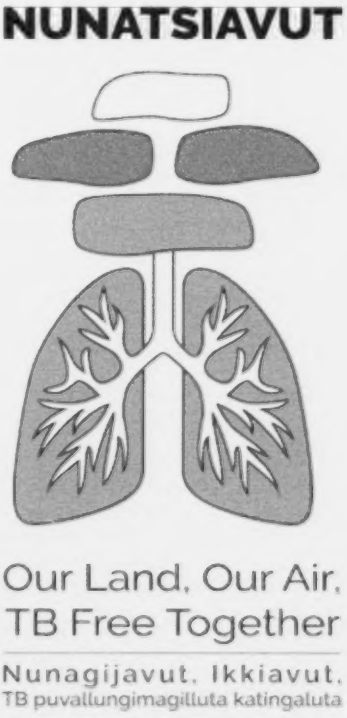
TB followed by a door-to-door screening campaign in Iqaluit. It is expected this campaign will contribute to successful control of TB in targeted communities and highlights the strength of Indigenous participatory research. To date, the campaign has led to more people getting screened and to a level of LTBI detection in high-risk residential areas that may not have been achieved through existing public health efforts.[42]

Various provincial and federal organizations, such as the First Nations Health Authority (BC) and the Northern Inter Tribal Health Authority (SK), have developed programs to address TB through enhanced screening and raising awareness of TB, and engaging on-reserve First Nations communities.

It is important to clear up misconceptions that can lead to stigma by enhancing awareness and education on TB in addition to screening and treatment for LTBI and active TB disease.[43,44] Furthermore, culturally competent care, provided by health care workers and families, increases treatment completion within foreign-born populations.[44] Building partnerships and community engagement to develop awareness and appropriate messaging may also be effective. A photovoice project called "Toronto unites to end TB" allows those with active TB disease, primarily Canadian newcomers, to overcome stigma by reflecting on their experiences.[45]

In 2016, a logo contest was held in Nunatsiavut as part of TB awareness campaign where they experienced an outbreak of TB that impacted on youth. The winning logo (shown) was developed by Vanessa Flowers for the community of Hopedale.

IMAGE 2:
A NUNATSIAVUT TB LOGO



Source: Nunatsiavut Government. (2017). Winners announced for TB and sexual health and wellness logo contests.

Medical advancements

While there is a vaccine for TB called the bacille Calmette-Guerin (BCG) vaccine, it has limited effectiveness, and is not recommended for routine use. However, it is still being used in regions of Canada where TB rates remain high, given that it does reduces the severity of the disease in children. Globally, the WHO/UNICEF estimated that in 2007, 89% of the global population were immunized with the BCG vaccine before the age of one.[46] Efforts are ongoing to develop a more effective vaccine that would help greatly to eliminate TB in Canada and internationally.[46,47]

TB can be cured. Treatment for active TB disease typically involves taking medication for six months with multiple antibiotics. The current standard for the treatment of LTBI is nine months of one antibiotic (isoniazid). Ongoing investment in TB drug research is needed to identify shorter, less toxic and more effective treatment regiments. A new treatment regime with a much shorter course for LTBI known as 3HP, a combination therapy of rifapentine and isoniazid, is as effective as the current standard treatment.[48] Currently an implementation study is underway in Ottawa and Iqaluit to determine if this shorter course of treatment will result in higher completion rates when compared to the standard treatment.[49] Rifapentine was recently placed on the List of Drugs for an Urgent Public Health Need in order to assist current TB elimination efforts. Health Canada will now allow its importation into Canadian jurisdictions that have notified the department of an urgent public health need.[50]

Rapid diagnosis and treatment to reduce transmission of the disease to others is essential to TB elimination. With recent introduction of the *GeneXpert*® automated diagnostic test in Iqaluit, Nunavut, the time between diagnosis and treatment of active TB disease has been significantly shortened by avoiding the need to send samples away for testing.[51]

Key in the quest for TB elimination is to prevent LTBI from developing into active TB disease in high risk groups. Research has demonstrated that interferon gamma release assay (IGRA) for LTBI screening, as opposed to the Tuberculin Skin Test (TST), may offer a more specific method to detect LTBI in those that have been previously vaccinated with BCG.[52] This is particularly relevant in certain Indigenous communities and foreign populations who are more likely to have been vaccinated with BCG.

Community-led TB initiatives

Ultimately, efforts to control TB will be more successful when the communities affected by TB in Canada are fully engaged, with the support of partners.

Boas Mitsuk is an Inuit youth champion dedicated to debunking the stigma and fear that still exists today related to TB in northern Inuit communities and the sanatoria of the past. He is raising awareness of the challenges associated with TB treatment and follow-up.

In 2013, Inuit Tapiriit Kanatami (ITK), the national representative organization for Canadian Inuit, published the **Inuit-specific TB Strategy** to outline a path forward for reducing the disproportionately high burden of TB disease across the Inuit homeland (Inuit Nunangat) (see Image 3). The Strategy takes a community partnership perspective, and proposes implementation of innovative screening and treatment approaches in combination with addressing social determinants of Inuit health to lessen the burden of TB disease among the population.[53] Furthermore, new investments have been dedicated over the next five years to supporting the elimination of TB across Inuit Nunangat.[39] To help achieve this, ITK is working with the Inuit TB Elimination Task Force to develop an elimination framework.

Global TB elimination efforts

Controlling TB in high incidence countries contributes to reducing TB transmission globally. This may also offer better returns on investment than screening and treating TB domestically.[54,55] Canada currently contributes to international programs that fund TB elimination programs, and has committed funding to Stop TB Partnership's TB REACH initiative.[56] Canada is linked to the global infectious disease burden. This includes **global TB antibiotic resistance**, which is currently rare in Canada.[57] Inadequate or interrupted treatment can contribute to antibiotic resistant strains of TB bacteria which can make the disease difficult or impossible to treat.[58] This emerging global trend may be further complicated by factors such as poverty, stigmatization and absence of community engagement.[58]

A more **targeted, pre-arrival screening program**, focusing on high risk individuals from countries with a high incidence of TB, may offer a more cost-effective approach for TB screening in migrants.[7,59] Additionally, the targeted screening and treatment of LTBI in migrant individuals at a higher risk of previous TB exposure, who have already arrived in Canada, may also reduce the rates of active TB disease.[43]

MOVING FORWARD

Now is the time for collective action that will guide the elimination of TB in Canada. We have an opportunity to build on the current momentum being generated by: renewed relationships with First Nations, Inuit and Métis; strong community leadership; and new, focussed investments. **TB is an infectious disease that disproportionately affects those who are at risk because they have less. It thrives in close living quarters, in people experiencing barriers to health care.** The work of the Inuit Tapiriit Kanatami shows us that TB elimination is within our reach when guided by a holistic strategy anchored in core principles, including respect and listening to people with lived experience.

Moving forward together, we must:

- **Harness collaboration –** There has never been a more timely opportunity to champion collaborative action between sectors on two key fronts – improving the social determinants of health that address underlying risk factors; and providing support to strengthen TB diagnosis and management. Investments made to improve housing, income support, HIV prevention awareness, prevention of problematic substance use and anti-smoking campaigns will not only address the social factors that place people at risk, but deliver health benefits that extend well beyond preventing TB. Coordinating health promotion messaging among all partners in health will have a more powerful impact than independent efforts.

- **Support community-led solutions –** The right solutions to this complex social disease will be driven by the communities themselves. Community leaders and champions are the key to success, whether they are respected elders, or a new generation of young and aware citizens. Efforts to eliminate TB can only succeed within a supportive environment that respects, understands and leverages language, culture, and the historical context in which decisions are made.
- **Sustain our efforts –** Technological advancements, research and medical solutions to improve diagnosis and treatment of LTBI will provide part of the solution to break the cycles of TB reactivation that lead to outbreaks and antimicrobial resistance. Success depends upon all partners and stakeholders sustaining the effort over the long term, embracing culturally appropriate and holistic approaches that build on the strengths and resiliency of individuals and communities.
- **End the stigma and discrimination associated with TB –** The underlying social, cultural, and historical factors that lead to shame and silence around TB need to be challenged through determined health education efforts. Indigenous and foreign-born people deserve the support that empowers them to seek diagnosis, treatment and care.

Levelling the playing field so that all Canadians can enjoy health will require true collaboration and innovative approaches. But everything is possible if we focus on improving the underlying conditions that affect health. In doing so, we can make a realistic push to end TB in Canada once and for all, while also promoting better overall health and quality of life for individuals, families and communities from coast to coast to coast.

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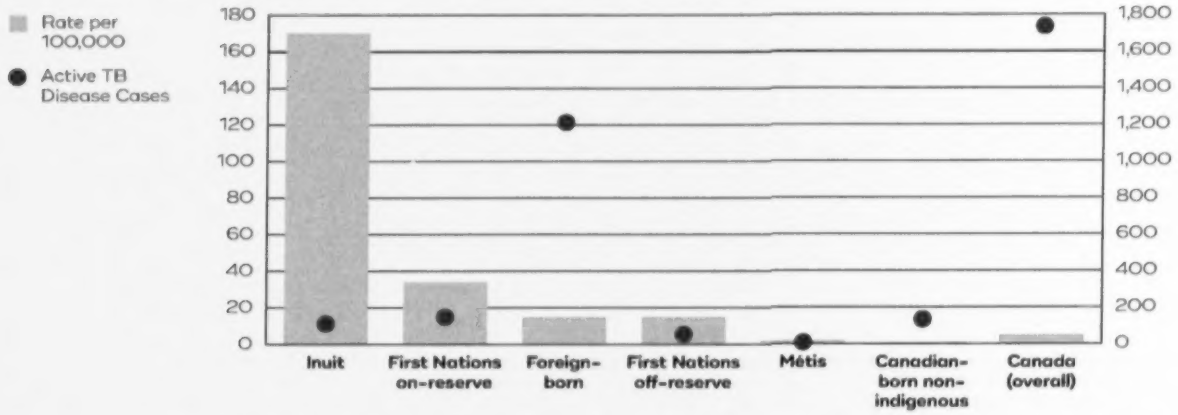
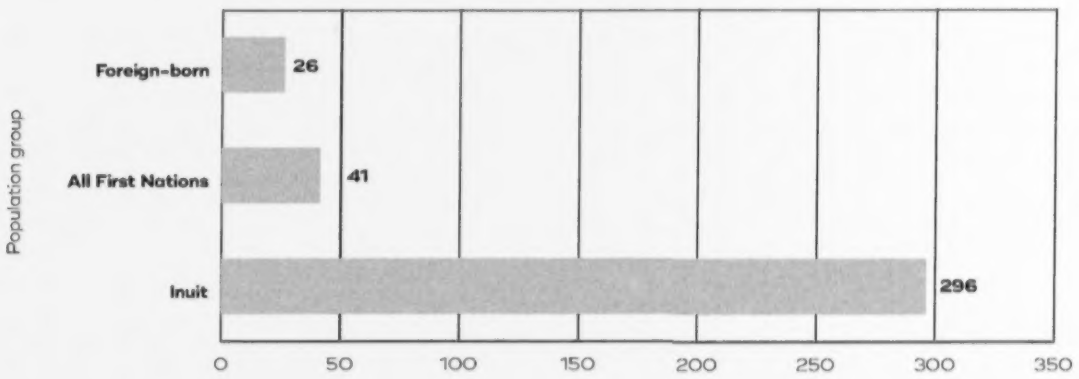
ANNEX

FIGURE 2:
CASES AND RATES OF ACTIVE TUBERCULOSIS CASES (NEW AND RE-TREATMENT) BY POPULATION GROUP, CANADA, 2016



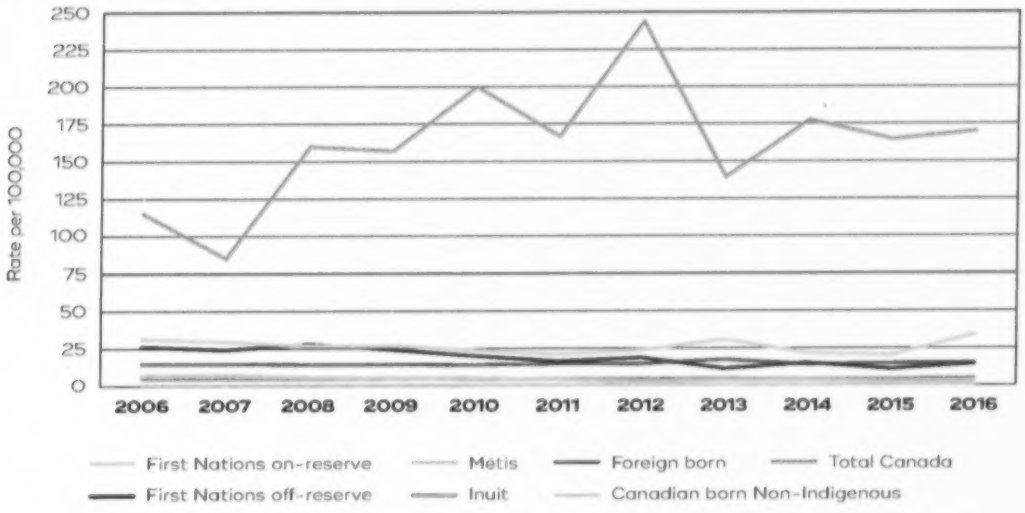
Source: Vachon, J., Gallant, V., Siu, W. (2018). Tuberculosis in Canada, 2016. Canada Communicable Disease Report, 44(3/4), 75-81.

FIGURE 4:
RATE RATIO RELATIVE TO THE CANADIAN-BORN NON-INDIGENOUS POPULATION RATE OF 0.6 PER 100,000, 2016



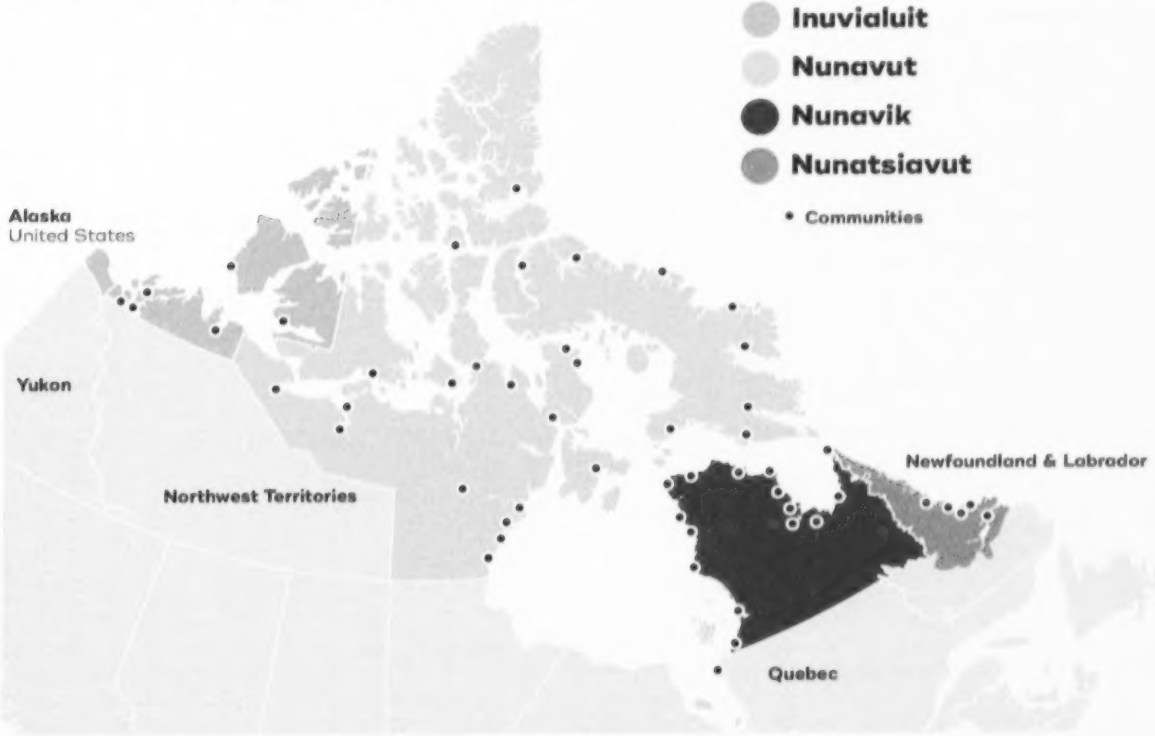
Source: Vachon, J., Gallant, V., Siu, W. (2018). Tuberculosis in Canada, 2016. Canada Communicable Disease Report, 44(3/4), 75-81.

FIGURE 5:
TUBERCULOSIS INCIDENCE RATES PER 100,000, BY POPULATION GROUP, CANADA, 2006–2016



Source: Vachon, J., Gallant, V., Siu, W. (2018). Tuberculosis 2016 – Supplementary Tables. Web exclusive. Canada Communicable Disease Report, 44(3/4).

IMAGE 3:
MAP OF NUNANGAT REGIONS AND COMMUNITIES



Source: adapted from Statistics Canada. (2015). The Early Learning Experiences of Inuit Children in Canada. Statistics Canada.